REMARKS

Claims 1-15 and 17-32 are pending in the application. Claims 1-15 and 17-32 stand rejected. Claims 1-15 and 17-32 remain in the application.

Claims 1-9 and 12-15, 17-32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koba (US 6,222,947) in view of Guttman et al. ("Guttman", US 6,366,918). The office action stated:

"As per independent claim 1, Koba teaches a digital image album layout system comprising:

"a page creator module operable to receive a set of images and user preferences and to generate album preference criteria using said user preferences, said page creator module having a first program algorithm operable to execute calculations on a first population of image criteria, said page creator module having a page evaluation module operable to test said first population for fitness to said album preference criteria, said page creator module being operable to distribute said images to a plurality of album pages responsive to said testing for fitness to said album preference criteria (col. 6, lines 43-59) and

"an image placement module operable to receive the set of images and user preferences and to generate page preference criteria using said user preferences, said page creator module laving a second program algorithm operable to execute calculations on a second population of page layout criteria, said image placement module having a layout evaluation module operable to test said second population for fitness to said page preference criteria, said image placement module being operable to distribute said images on respective said album pages responsive to said testing for fitness to said preference criteria (col. 7, lines 37-41).

"Koba does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique to generate album preference important values indicating a weighting of corresponding user preferences relative to each other. Guttman teaches a genetic algorithm approach to produce the optimized publication layouts by generating and evaluating a large number of possible layouts and selects the optimum layout (col. 3, lines 1-9) using mutation (e.g., col. 7, lines 47-

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59) and cross-over functions (e.g., col. 8, lines 42-47). It would have been obvious to an artisan at the time of the invention to use the teaching from Guttman of applying genetic programming in Koba's system since the uses of a genetic algorithm approach would have generated and evaluated, in a timely manner, a large number of possible page layouts and selected optimum layout."

and also stated:

"Applicant's arguments filed 10/26/2005 with respect to claim 1 have been fully considered but they are not persuasive.

"Applicant argued that in Koba, the user inputs the degree of importance of each image along with preferences for various page assignment and layout criteria. This is unlike the claimed invention, in which importance values are not associated with individual images, but rather indicate a weighting of corresponding user preferences relative to each other.

"Koba does not teach importance values indicating a weighting of corresponding user preferences relative to each other, however, as a combination between Koba and Guttman, Koba's system would have implemented Guttman's genetic algorithm technique of mutation (e.g., col. 7, lines 47-59) and cross-over functions (e.g., col. 8, lines 42-47) to evaluate importance values indicating a weighting of corresponding user preferences relative to each other. By doing this, Koba's system would have been improved the evaluating importance-values process by using Guttman's efficient genetic algorithm, instead of importance values are associated with individual images."

Claim 1 states:

1. A digital image album layout system comprising:

a page creator module operable to receive a set of images, a plurality of different user album preferences, and a plurality of album preference importance values, each said album preference importance value indicating a weighting of a corresponding one of said user album preferences relative to the other said user album preferences, and to generate album preference criteria using said user album preferences and

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album preference importance values, said page creator module having a first genetic engine operable to execute genetic evolution calculations on a first genetic population of album criteria, said page creator module having a page evaluation module operable to test said first genetic population for fitness to said album preference criteria, said page creator module being operable to distribute said images to a plurality of album pages responsive to said testing for fitness to said album preference criteria;

an image placement module operable to receive the set of images, a plurality of different user page preferences, and a plurality of page preference importance values, each said page preference importance value indicating a weighting of a corresponding one of said user page preferences relative to the other said user page preferences, and to generate page preference criteria using said user page preferences and page preference importance values, said image placement module having a second genetic engine operable to execute genetic evolution calculations on a second genetic population of page layout criteria, said image placement module having a layout evaluation module operable to test said second genetic population for fitness to said page preference criteria, said image placement module being operable to distribute said images on respective said album pages responsive to said testing for fitness to said page preference criteria;

wherein said page creator module and said image placement module operate separately.

The amended language of Claim 1 is supported by the application as filed, notably the original claims, and at Figure 7, page 10, line 26 to page 11, line 3; and page 15, lines 8-11.

Claim 1 requires that a page creator module and said image placement module operate separately. Each of these two modules includes its own genetic engine that produces a respective genetic population and its own evaluation module that tests the respective genetic population. Koba and Guttman, in any combination, do not teach or suggest a page creator module and image placement module that operate separately. Koba, the rejection states in relation to Claim 1:

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"does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique to generate album preference important values indicating a weighting of corresponding user preferences relative to each other."

Guttman discloses the use of a <u>single</u> genetic engine to execute genetic evolution calculations and produce a <u>single</u> genetic population:

"More specifically, the present invention uses a genetic algorithm approach to produce the optimized publication layouts. In a timely manner, the invention generates and evaluates a large number of possible layouts and selects the optimum layout. The optimal layout has an optimal relationship between the placement of advertisements and editorials on the pages of the publication resulting in a maximization of revenue and a minimization of costs." (Koba,

col. 3, lines 1-9; also see col. 7, lines 9-29 and col. 8, lines 1-17)

In Guttman, there is also a single evaluation of the genetic population for all criteria. Guttman states:

"Block 306 represents the computer 100 evaluating the fitness of the different publication layouts. As indicated above, each of the ordered list in the population comprises the same PlaceableItem objects 210, but in different orders, and the Dummy objects 212 are evaluated depending whether or not all the PlaceableItem objects 210 in the ordered list can be placed in the publication layout with the attributes of both the PlaceableItem objects 210 and the Dummy objects 212 satisfied. The evaluation of the publication layout represented by the Dummy objects 212 comprises an aggregation of the fitness values for each individual PlaceableItem object 210 in the list. Also included in the evaluation is a calculation to determine how much it would cost to print each layout. Further, the evaluation includes an analysis of the aesthetics of the layout. These various criteria are then combined into a total fitness value for the specific ordered list." (Koba, Figure 3; col. 8, lines 1-17; also see col. 7, lines 9-29)

Koba, similarly, has a single confirmation step S109. Koba states:

"In step S109, the user checks the layout pattern of the page which has been laid out, and determines whether to confirm it. If NO in step S109, the flow advances to step S110 to input information indicating whether to modify all the pages. If it is determined that all the pages are to be modified, the flow advances to step S105. If it is determined that some pages are to be modified, the flow returns to step S106 to determine a template for the designated page again." (Koba, Figure 2; col. 4, lines 49-56; also see Figure 4; col. 7, lines 50-63)

A combination of the two cited references would teach a single evaluation. This is unlike Claim 1, in which a page evaluation module and a layout evaluation module each test a respective genetic population.

Claim 1 also requires a page creator module <u>operable to receive</u> images, album preferences, and <u>album preference importance values</u>; to generate album preference criteria using the album preferences and album preference importance values; and to test a first genetic population for fitness to the album preference criteria. The album preference importance values <u>that are received</u> indicate a weighting of a corresponding one of the album preferences relative to the other album preferences. Claim 1 also requires an image placement module <u>operable to receive</u> the images, page preferences, and <u>page preference importance values</u>; to generate page preference criteria using the page preferences and page preference importance values, and to test a second genetic population for fitness to the page preference criteria. The page preference importance values <u>that are received</u> indicate a waiting of a corresponding one of the page preferences relative to the other page preferences.

The cited references do not teach or suggest a page creator module operable to receive album preference importance values and an image placement module operable to receive page preference importance values. The rejection argues that the combination of the cited references teaches a different feature, which does not meet the language of Claim 1. The rejection states, in relation to Claim 1:

"Koba does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique <u>to</u> <u>generate album preference important values</u> indicating a weighting of

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corresponding user preferences relative to each other. Guttman teaches a genetic algorithm approach ..." (emphasis added)

The office action states similarly in the Response to Arguments:

> "Koba does not teach importance values indicating a weighting of corresponding user preferences relative to each other, however, as a combination between Koba and Guttman, Koba's system would have implemented Guttman's genetic algorithm technique of mutation and cross-over functions to evaluate importance values indicating a weighting of corresponding user preferences relative to each other. By doing this, Koba's system would have been improved the evaluating importance-values process by using Guttman's efficient genetic algorithm, instead of importance values are associated with individual images."
>
> (citations omitted)

To whatever extent the combination of the cited references teaches use of the genetic algorithm of Guttman to <u>generate</u> preference importance values, that teaching argues for the patentability of Claim 1, since Claim 1 requires a page creator module <u>operable to receive</u> images, album preferences, and album preference importance values and an image placement module <u>operable to receive</u> the images, page preferences, and <u>page preference importance values.</u>

> Claim 1 requires a page evaluation module operable to test a first genetic population for fitness to album preference criteria generated using user album preferences and album preference importance values. Claim 1 also requires a layout evaluation module operable to test a second genetic population for fitness to page preference criteria generated using user page preferences and page preference importance values. The office action stated, in this regard:

> "as a combination between Koba and Guttman, Koba's system would have implemented Guttman's genetic algorithm technique of mutation (e.g., col. 7, lines 47-59) and cross-over functions (e.g., col. 8, lines 42-47) to evaluate importance values indicating a weighting of corresponding user preferences relative to each other. By doing this, Koba's system would have been improved the evaluating importance-values process by using Guttman's efficient genetic algorithm, instead of importance values are associated with individual images."

The office action does not address how one of skill in the art would have determined the user preferences to use in a combination of Koba and Guttman. The rejection argues that, in the combination of the two cited references, the system of Koba would have looked to the criteria of Guttman rather than importance values associated with individual images. The cited references do not support this position. In Koba, the user inputs the degree of importance of each image along with preferences for various page assignment and layout criteria. (Koba, col. 6, lines 7-20; col. 6, lines 43-59; col. 7, lines 20-30; col. 7, lines 37-39) Guttman uses multiple criteria to select an optimum layout that:

> "has an optimal relationship between the placement of advertisements and stories on the pages of the publication, the maximization of revenues, and the minimization of printing costs." (Guttman, abstract; also see col. 3, lines 5-9)

> "The evaluation of the publication layout represented by the Dummy object 212 comprises an aggregation of the fitness values for each individual PlaceableItem object 210 in the list. Also included in the evaluation is a calculation to determine how much it would cost to print each layout. Further, the evaluation includes an analysis of the aesthetics of the layout. These various criteria are then combined into a total fitness value for the specific ordered list." (Guttman, col. 8, lines 9-17; emphasis added)

Why would one of skill in the art not include the degree of importance of each image along with other criteria in a combination of Koba and Guttman, since Guttman teaches considering multiple criteria?

The cited references, in any combination, do not teach or suggest generation of fitness criteria using user preferences and importance values for those preferences. Koba states, in relation to preference criteria:

> "In step S203, a questionnaire is given to the user to cause the user to input the following pieces of information to the initial parameter setting means 33 by using the keyboard 7: (1) the degree of importance of each image; (2) a criterion for determining the assignment of the images to the respective pages, e.g., photographic date information or the degree of importance of each image; (3) the approximate number of images to be laid out per page; (4) the approximate layout position of each image; (5) a

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favorite color; and the like. For example, as (4) the layout position of each image, the user inputs information indicating his/her preference for a layout pattern, i.e., a neat layout like the one shown in FIG. 6A or an untidy layout like the one shown in FIG. 6B, in laying out three images on one page." (Kobe, col. 6, lines 7-20)

"In step S205, the initial parameter setting means 33 determines the images, of the images belonging to each group, which are to be laid out on each page. Assume that the user has designated the assignment of three images to each page in response to question (3) in step S203. In this case, if, for example, the seven images formed into the first group are sequentially laid out, from the first image, three images at a time for each page, three images are laid out on each of the first and second pages, whereas one image (the seventh image) is laid out on the third page. When, however, only one image is laid out on the third page, the resultant layout is poor in balance with an excessive blank space. For this reason, it is determined that three images are assigned to the second page. This operation can be realized by reducing the image designated as an image with a low degree of importance by the user, as needed." (Koba, col. 6, lines 43-59)

"In step S206, the initial parameter setting means 33 sets the initial parameters required for automatic layout processing for each page. More specifically, the initial parameter setting means 33 sets the approximate layout position of each image on one page, which has been designated in response to question (4) in step S203, and a background image corresponding to the favorite color input in response to question (5) in step S203 as initial parameters. As the background image, an image with a sense of the season is set in accordance with the photographic date information input together with the images. In addition, if caption information is input, a background is set on the basis of this informtion." (Koba, col. 7, lines 20-30)

"In step S207, the automatic layout means 31 executes automatic layout processing on the basis of the initial parameter set in the above manner." (Koba, col. 7, lines 37-39)

In Koba, the user inputs the degree of importance of each image along with preferences for various page assignment and layout criteria. This is unlike the claimed invention, <u>in which importance values are not associated with individual images</u>, but rather indicate a weighting of corresponding user preferences relative to each other.

Guttman et al. optimizes a genetic population relative to costs and revenues:

> "An optimal layout is a layout that satisfies advertisers' requirements, maximizes revenues, and minimizes costs." (Guttman et al., col. 8, lines 21-23)

This is unlike the claimed invention, which tests genetic populations with preference criteria generated using user preferences and importance values that indicate weightings of the user preferences relative to each other.

The rejection argues motivation for combining Koba and Gutman that states:

> "It would have been obvious to an artisan at the time of the invention to use the teaching from Guttman of applying genetic programming in Koba's system since the uses of a genetic algorithm approach would have generated and evaluated, in a timely manner, a large number of possible page layouts and selected optimum layout."

As noted in the previous amendment, a textbook discussion of genetic algorithms indicates that operation of a combination of Guttman et al. and Koba in "a timely matter", is not readily predictable:

> "Because there are many heuristics to choose as well as parameters to set, it is hard to make firm theoretical statements about building classifiers by means of evolutionary methods. The performance and search time depend upon the number of bits, the size of a population, the mutation and crossover rates, choice of features and mapping from chromosomes to the classifier itself, the inherent difficulty of the problem and possibly parameters associated with other heuristics." (*Pattern Classification*, 2nd ed., R. Duda, P. Hart, D. Stork, John Wiley & Sons, Inc., New York, 2001, page 378)

One of skill in the art, in view of the above-quote from *Pattern Classification*, would not be motivated by Guttman et al., col. 3, lines 1-9 to combine modify Koba with Guttman et al. on the basis of Guttman et al.'s discussion of "a timely manner". The motivation to combine Koba and Guttman et al. has also not overcome the teachings of early cited Johnson (US 2001/0019630). The mention in Johnson, of the use of genetic programming teaches or suggests that Johnson was aware of both genetic programming and genetic algorithms and, despite that knowledge, chose to use fuzzy logic in a classifier. As earlier discussed, Johnson's fuzzy logic approach has advantages, as noted in the Office Action mailed 11/18/2004.

Claims 29-30 are allowable as depending from Claim 1.

The above discussions of a claim requirement of importance values that are not associated with individual images and lack of motivation for the cited combination of references are applicable to all of the claims.

The office action stated in relation to Claim 2:

"As per independent claim 2, Koba teaches an automated album layout method responsive to a set of inputs containing digital images, graphics, and other 2-dimensional objects, comprising the steps of:

"receiving pluralities of user album preferences, said user album preferences indicating parameter values including at least one of balance, emphasis, chronology and unity (col. 6, lines 7-42 and col. 6, line 55 - col. 7, line 19).

"generating a fitness function based upon said user album preferences (e.g., col. 6, lines 43-59),

"evaluating a grouping of the image objects for distribution into a number of album pages using a genetic algorithm, according to said fitness function (col. 6, lines 43-59);

"assigning each image object to a page based on user preferences, including balance (col. 6, line 52 - col. 7, line 13);

"displaying said page for user viewing, and refining the distribution based on said evaluating (S210 of fig. 4 and fig. 5C and 5G).

"Koba does not disclose the first program algorithm and the second program algorithm to implement genetic programming technique to

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generate album preference important values indicating a weighting of corresponding user preferences relative to each other. Guttman teaches a genetic algorithm approach to produce the optimized publication layouts by generating and evaluating a large number of possible layouts and selects the optimum layout (col. 3, lines 1-9) using mutation (e.g., col. 7, lines 47-59) and cross-over functions (e.g., col. 8, lines 42-47). It would have been obvious to an artisan at the time of the invention to use the teaching from Guttman of applying genetic programming in Koba's system since the uses of a genetic algorithm approach would have generated and evaluated, in a timely manner, a large number of possible page layouts and selected optimum layout."

Claim 2 requires receiving user album preferences and album preference importance values and generating a fitness function based upon the received user album preferences and received album preference importance values. As was discussed above in relation to Claim 1, there is no teaching or suggestion in the cited references as to receiving album preference importance values. Guttman is cited in relation to generating and evaluating possible layouts. This does not meet the language of Claim 2.

Claims 3-5 are allowable on grounds like those of Claim 2.

Claim 6 requires:

"means for receiving a plurality of user album preferences and a plurality of album preference importance values,

and

"means for receiving a plurality of user page preferences and a plurality of page preference importance values".

and, for this reason is allowable on the grounds discussed above in relation to the receiving of preference importance values.

Claim 6 also states:

"a first genetic engine operable to evolve said first genetic population to produce a present set of image page assignments"

and

"A second genetic engine operable to evolve said second genetic population to produce a set of image placement parameters".

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Claim 6, thus, requires two different genetic engines, each operable to evolve a different genetic population. As discussed above, the cited combination of references teaches use of a single genetic engine operable on a single genetic population, which does not meet the language of Claim 6.

Claim 6 requires two different evaluation modules:

"a page evaluation module operable to generate an album fitness function" and

"a layout evaluation module operable to generate a page fitness function". As discussed above, the cited references teach only a single evaluation of the genetic population.

Claim 6 requires both:

"means for outputting said present set of image page assignments if said album score meets an album threshold value"

and

"means for outputting said image placement parameters if said page score meets a page threshold value".

This is also incompatible with the single evaluation taught by the cited references.

Claim 6 also requires:

"means for specifying an initial set of placement parameters of the images to a second genetic population in accordance with said outputted set of image page assignments".

The combination of the cited references teaches no such means for specifying, since the criteria are considered in a single valuation.

Claims 7-8 are allowable on grounds like those discussed above in relation to Claim 2.

Claims 28 and 31-32 are allowable as depending from Claim 7.

Claims 9 and 13 are allowable as depending from Claim 8.

Claims 12, 14, 17-18, 22, and 24 are allowable on grounds like those discussed above in relation to Claim 2.

Claim 15 is allowable as depending from Claim 14.

Claims 19-21, 23, and 25 are allowable as depending from Claim 18.

Claim 26 is allowable as depending from Claim 24.

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Claim 27 has been amended to require:

"wherein said evolving of said first genetic population, said generating of said album fitness function, and said testing according to said album fitness function are separate from said evolving of said second genetic population, said generating of said page fitness function, and said testing with said page fitness function"

and is supported and allowable on the same grounds as Claim 1.

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Koba in view of Guttman and further in view of Wang (US 6,014,458). Claims 10-11 are allowable as depending from Claim 8.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,

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